

of the lava currents of Auvergne. M. Lecoq had in his museum some fossil remains of the Marmot, the Mammoth, and the tichorhine Rhinoceros, and he distinctly told us that these relics of northern mammalia, which geologists are accustomed to associate with glacial times, were mostly found in cracks and fissures in the lava-streams near Clermont Ferrand. From this it would appear that the latest lava streams of Auvergne had become cold, consolidated, and fissured before the introduction of the bones and teeth of the northern quadrupeds into the fissures.

But if this prove to be true, on further investigation, I do not wish to imply that there have been no volcanic eruptions in Central France since the last outpour of lava currents, or the days of the Mammoth. On the contrary, I think the evidence is the other way. I have just returned from a visit to the extinct volcanoes of the Haute Loire and the Ardèche, where I was accompanied by my friends Sir William Guise, Capt. Price, and Mr. Lucy; and I believe there is evidence of a certain amount of volcanic action in the Ardèche since the outpouring of the later lava-streams. There are outbursts of volcanic ash and scoriae which form what are termed "chimneys," and which are blown right through the most recent lava-currents. Both near Montpezat, so admirably depicted by Mr. Scrope, and near the bridge at La Beume, there are outbursts and eruptions through the basalts, which dislocate and throw off the basaltic columns. It is not improbable that some of these attempts at forming a volcano happened in the Ardèche during the fifth century, when the Archbishop of Vienne, Alcimus Avitus, in his homily on the "Rogation Days," speaks of "frequent shocks of earthquakes," and "fires often blazing," and "piled up mounds of ashes." Gregory of Tours also speaks of stags and wolves wandering about Vienne. These wild animals may have been driven from the forests of the Ardèche, by these last volcanic eruptions, as far as Vienne.

W. S. SYMONDS

#### Communication of Information among Bees

SOME two or three years ago a swarm of bees entered a very small hole under the slates near the eaves of the roof of my house in the Highlands, and established themselves for the summer but died out in the subsequent winter. I infer that there were no survivors among the bees to remember the circumstance (see Appendix to Kirby and Spence's "Entomology") and to account in any degree for what occurred this summer.

The house is of four stories, and stands in the garden, in which, about fifty yards from the house, on the other side of a hedge, are my beehives. For a few days, during which there were the usual indications of swarming being imminent in one of the hives, a great many bees found their way into the lower rooms of the house; there was a constant hum of bees in one of the chimneys, at the top of which there was always a group flying about. The top of this chimney is about thirty feet horizontally from the settlement of the old swarm, and fifteen feet above it; there was also occasionally a cluster of bees on the roof of a "semi-detached" lower building (the kitchen) on the other side of the house from the old settlement, but as far as we saw no bees visited the old settlement, and nothing indicated any intention of the swarm to go there, though we expected it to make for the house and probably for the chimney I have mentioned. In due time the swarm came off and rose unusually high, and I immediately made some smoke in the chimney to prevent their entering it. Presently the swarm settled on a low apple-tree and was snugly hived in the usual way in a straw "skep" about noon. Next day, however, about 10 A.M., the swarm left its "skep" and made for the old settlement without any hesitation, and there they established themselves in spite of all we could do.

Of course the whole proceedings may have been disconnected, but the impression left on my mind was that the queen, or her counsellors, had previously "prospected," and resolved to go to the old settlement as an eligible "location," and that the common bees learned somehow that "the house" was to be their destination, but that some of them fancied the chimney, others the roof of the kitchen, and others wandered vaguely in at various open windows, while the queen knew exactly where she wanted to go, but got confused the first day.

The manner in which the bees learned that the house was to be their destination may have been that the queen in her investigations had left strong traces of herself at the chimney and on the roof of the kitchen, which attracted the bees to these places, and a general odour of royalty about the house which induced the bees to come in at the windows; but it may have been that there was some "talk" in the hive about it. In connection with

Sir John Lubbock's papers, the incidents may be worth your notice.

There has also been some question as to the distance bees go in search of "pasture." It may be worth noting that at Arisaig House, I am told, bees are to be found in the peach-house every spring at the time of the blossom, while, so far as I can learn, there are no hives within ten miles but my own, which are separated from it by an arm of the sea (Loch Ailtor), a mile wide with islands, and a second arm of the sea (Loch-na-Nuadh), two miles wide without islands, the whole distance being about four miles from the hives to the peach-house.

University of Glasgow, Nov. 13

HUGH BLACKBURN

#### A New Palmistry

I HAVE lately consulted two standard works upon the proportions of the human figure to which Prof. Ecker does not refer in the suggestive paper of which I gave an abstract in NATURE (vol. xiii. p. 8), in the hope of finding some definite information as to the relative lengths of the "index" and "ring" fingers. In the first of these two works, Quetelet's "Anthropometrie" (Bruxelles, 1870), no mention whatever is made of the proportions of the several digits, whether of hand or of foot; while from the second authority, the "Proportionslehre" of Carl Gustav Carus (Leipzig, 1854), all the information that can be derived, meagre as it is, is purely inferential. In the skeleton of a hand represented at Fig. 4, Taf. iii. of this fine folio work, the "index" is considerably longer than the "ring" finger; and in the letter-press explanatory of this plate, a table is given of the lengths of the various factors of the digits, e.g. the metacarpals and the three phalanges, in "modul-minutes," constant lengths, each of which is equivalent to about seven millimetres. Now the length of the "index" is twenty-three, while that of the "ring" finger is only twenty "modul-minutes," the former thus exceeding the latter digit by about twenty-one millimetres, a difference much greater than any which has been recorded by Prof. Ecker. In the extended left hand of an ideal (sexless) figure, at Taf. iv. (*ibid.*), the "ring" and "index" digits are of the same length, the former being perhaps a shade longer.

Regiments and large asylums would be a fertile field for the further investigation of this interesting and highly suggestive subject.

J. C. GALTON

In Mr. J. C. Galton's interesting article bearing the above title, in NATURE, vol. xiii. p. 8, no mention is made of the position of the hand at the time of making the observation as to the comparative length of the fingers. Perhaps Mr. Galton will kindly make it known whether Dr. Ecker has specified the position which he adopted. That the position makes some difference may be clearly seen in the following manner:—

Place the hand, back upwards, horizontally across the front of the chest, and observe the comparative length of the "index" and "ring" fingers. Then, by a motion of the wrist, moving the arm as little as possible, turn the hand outwards in the same plane, until the fingers stand at right angles to their first position, and again observe the two fingers. Naturally the "index" will appear to be longer in the first position than in the second, on account of the different condition of the muscles. Neither of these positions is likely to be adopted by anyone investigating the subject, but in any comparison of results *one and the same* position should be referred to as a standard, and this standard should specify whether the hand is held with the back or the face upwards. Dissimilarity between the two hands, as mentioned by Mr. Pryor, appears to be common. F. T. MOTT

Leicester, Nov. 19

I HAVE made a collection of over fifty outlines of the fingers of European hands (right and left). At present I find that the tendency in the female hand is to a proportionately longer third than index, in both hands, than in the male. In all the hands I have examined, the third finger of the left hand (when longer than the index) is also proportionately longer than the same finger of the right. In this series I have found only one case of an index longer than the third, and only one in which they were equal (both males). These are all carefully drawn into a pocket-book, care being taken that the hand is perfectly free from any muscular strain, which alters the result very appreciably; and the race, sex, and general physical characteristics are noted on the sheet. The list at present includes some eminent classical

scholars, a distinguished artist, and numbers of persons of more than average culture; yet there appears to be no correspondence between the mind and the length of the index finger.

R. A. N.

### Extraordinary Tides

In last week's "Notes" you say, speaking of the unprecedentedly high tide of the 15th inst., that "no one seems to have expected an unusual tide." Allow me to state, sir, that in the *Spectator* of Nov. 7th, 1874, I predicted this extraordinary tide. As a matter of fact, the tide was higher than that of March 1874, through the unusually swollen state of the river by floods and the N.W. gale.

No extraordinary tide can occur this side of March 1878.  
4, Buccleuch Place, Dulwich

B. G. JENKINS

### Further Linkage Work

In the interesting communication to NATURE, vol. xii. pp. 214-216, Prof. Sylvester gives account of the Hart and the Sylvester-Kempe "linkages." Of four points, three have work assigned. Problem: To employ the nondescript point.

First.—The Hart linkage yields the *Cissoid*, exactly as that curve is defined. Thus, with  $\rho$  circling,  $q$  resting, and  $s$  tracing straight line;  $r$  traces cissoid. Second.—The Sylvester-Kempe linkage yields the *Hyperbola*, in that curve's simplest vector form. Thus, with  $r$  opposite to  $\rho$  resting, and  $p_1, p_2$  in constant directions;  $r$  traces the hyperbola whose asymptotes are these directions.

GEO. J. P. GRIEVE

Burntisland, N.B.

### A Criminal Dog

I WAS so much pleased with the anecdote in NATURE (vol. xiii. p. 36) of the criminal dog who buried the cat he had murdered, that I told my wife; but I did not mention the breed of the dog.

She said, "Was it not a retriever? because they always bury their food, so that it may become *high*." I could but answer that it was a retriever, and added that I was afraid she had hit upon the real reason for the act.

R. S. CULLEY

General Post Office, Nov. 12

### OUR ASTRONOMICAL COLUMN

THE BINARY STAR 44 BOOTIS.—In No. 2,064 of the *Astronomische Nachrichten*, Dr. Doberck, of Markree Observatory, has given an orbit of this binary, and a comparison with measures to the present year. The elements are—

Peri-astron passage	...	...	...	1783°01'
Node	...	...	...	65° 20'
Peri-astron from node on orbit	...	...	...	1° 18'
Inclination	...	...	...	70° 5'
Excentricity	...	...	...	0° 71'
Semi-axis major	...	...	...	3° 093
Period of revolution	...	...	...	261° 12 years.

Dr. Doberck makes no reference to Sir W. Herschel's second measure in 1802, giving for the angle 62° 59', or less than 3° in advance of his measure 1781, August 17, when the companion was first detected. The measure of 1802 was registered s.p. and "corrected by a subsequent observation to n.f." as Sir John Herschel states in Memoirs R.A.S. vol. v. p. 46; but it is now pretty evident, from a projection of all the measures to 1875, that the quadrant was correctly registered s.p., and consequently the angle for 1802°246 should be 207° 1' according to our present method of reckoning. The angle calculated for this time from the above orbit is 206° 55', and this close agreement must be taken as very satisfactory evidence that Dr. Doberck has given us something like the true orbit, notwithstanding the difficulty of the case. It had been surmised that Sir W. Herschel's measures were to be increased 180°, Struve, in 1819, obtaining an angle of 228°, and Herschel and South, in 1821, 229°, but the position of the companion on the preceding

side of the principal star, instead of the following side where it had been seen in 1781, was accounted for both by Sir John Herschel in his "Micrometrical Measures of 364 Double Stars," and by Struve in "Mensurae Micrometricæ," by supposing motion in an orbit passing nearly through the eye of the observer, with the longer axis of the ellipse but slightly inclined to the meridian. Dr. Doberck finds an inclination to the tangent plane of the heavens, of 70°. Calculating from his elements, the following appear to have been the angles and distances from 1785 to 1800:—

1785°0	...	Position	74°0	...	Distance	0° 85'
90°0	...	"	98° 3'	...	"	0° 55'
92°5	...	"	132° 0'	...	"	0° 50'
1795°0	...	"	162° 7'	...	"	0° 53'
1800°0	...	"	199° 0'	...	"	0° 86'

The calculated distance for epoch of Sir W. Herschel's measure in 1781 is 0° 89, and for that of 1802, 1° 05'; the observed distances being only by estimation in diameters of the companion, giving " $\frac{1}{2}$  or  $\frac{2}{3}$  diameter" of smaller star in 1781, and "barely  $\frac{1}{2}$  diameter" in 1802, with power 460 in both years, are perhaps sufficiently well represented, though very admissible correction to one or two of the elements may diminish the distance in 1802 or increase that in 1781.

For comparison with future measures we have from Dr. Doberck's orbit—

1876°0	...	Position	241°45'	...	Distance	4° 887'
78°0	...	"	241° 71'	...	"	4° 928'
80°0	...	"	241° 97'	...	"	4° 971'

THE MINOR PLANETS.—In No. 35 of the Circulars of the *Berliner Astronomisches Jahrbuch*, Prof. Tietjen notifies an arrangement which has been entered into by the Observatories of Leipsic, Leyden, Lund, Pola, and Vienna, for the more systematic and regular observation of the small planets. These Observatories have agreed to report to the editor of the *Jahrbuch*, every fortnight, the names or numbers of the planets which have been observed, with the dates of observation and the limits within which the planets whose positions are more uncertain have been sought. These communications will be so timed that they may arrive at Berlin on the 1st and 15th of the month, and will be there arranged, printed, and circulated. An invitation is extended to those Observatories where the small planets are occasionally, though not regularly, observed, to join in the proposed scheme. In the same manner the state of calculation as regards the various members of this group will be made known. The Milan Observatory has already engaged itself to calculate for No. 151.

Mr. Daniel Kirkwood, of Bloomington, Indiana, writes with reference to the resemblance which exists between the elements of certain minor planets, instancing as the most striking case that of No. 54, Alexandra, and No. 141, Lumen. An inadvertent application of the angle usually designated  $\omega$  (or the distance of perihelion from node) in the wrong direction, renders the similarity between the orbits of these planets somewhat less striking than in Mr. Kirkwood's communication, but there is nevertheless considerable resemblance, as the following figures will indicate:—

	Alexandra.	Lumen.
Perihelion	294° 16'	341° 32'
Node	313° 49'	318° 59'
Inclination	11° 47'	11° 33'
Excentricity	0° 1987	0° 2233
{ Mean distance	2° 7093	2° 7095
Period	1628°9 days.	1629°0 days.

THE ZODIACAL LIGHT.—Those who are interested in the observation of this phenomenon will do well to be on the alert during dark evenings in the winter months. The most conspicuous exhibitions of the light in this country during the last few years have occurred in the month of January, the long standing recommendation to